



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

re Application of:

Bator et al.

Serial No.: 09/751,975

Group Art Unit: 3724

Filed: December 29, 2000

Examiner: Prone, Jason

For: APPARATUS AND METHOD FOR
SEPARATING CIRCUIT BOARDS

Attorney Docket No.: 199-1933 (VGT 0137 PA)

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Karen A. Hopf

BRIEF ON APPEAL

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Appeal
filed on April 18, 2007, for the above-identified application.

The Commissioner is authorized to charge the fee for filing the Brief on Appeal to Deposit Account No: 50-0476.

I. Real Party in Interest

The real party in interest in this matter is Visteon Global Technologies, Inc., Dearborn, Michigan (hereinafter "Visteon").

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 18, 20 and 21 stand rejected in the Final Office Action. A copy of the claims on appeal is attached as an Appendix.

IV. Status of Amendments Filed After Final

There have been no amendments filed subsequent to the final rejection.

V. Summary of the Invention

The present invention is an apparatus for separating a multiple circuit board array 20 into a plurality of individual circuit boards 10 such that multiple board arrays 20 can be produced and automatically divided up into individual circuits 20.

The present invention solves problems associated with breaking a multiple board array 20 into a plurality of individual circuit boards 10. These include that common configuration wherein connecting pins 18 commonly extend of f the sides of the circuit boards 12. In addition, the circuit boards 10 include a plurality of electronic components 16 mounted on the circuit board 12. Therefore, mechanical systems must be developed by which to snap the individual circuit boards 10 from the multi-board array 20 without damaging the connecting pins 18

which extend over the pre-scored planes 28 or loading electrical components 16. Securing and loading the multiple board array 20 is also difficult as the electronic components 16 cannot commonly support any form of loading. The present invention addresses this by using a splitting element 36 aligned with a pre-scored plane 28, on the multiple board array 20. A torque inducing element 38 induces edge loading on the multiple board array 20 such that the individual circuit board 10 can be broken off the multiple board array 20 without loading the electrical components 16 are damaging the connecting pins 18. The present invention utilizes a shield element 14 to prevent direct loading of the electrical components and reduce flexing of the circuit board 12 during separation from the multiple board array 20. Undesirable flexing can damage the components 16 or their electronic connection to the circuit board 12.

There are three independent claims. Claim 18 claims a method of separating individual circuit boards 10 from a multiple board array 20 having pre-scored planes 28. The claims aligning the pre-scored planes 28 with a splitting element 36; loading a removable shield element 14 to reduce board flex; and inducing torque onto the multiple board array 20 to split it along the pre-scored plane.

Claim 20 is directed towards an apparatus having a splitting element 36 aligned with the pre-scored plane 28; a torque inducing element 38 loading the multiple board array 20 through the shield element 14 to protect electrical components 16 from damage; and a transport element 32 for automatically aligning the pre-scored planes 28 with the splitting element 36.

Claim 21 is directed towards a method claim similar to claim 18 however further including limitation language wherein torque is applied to the multiple board array 20 by transferring load from a torque inducing element 38 through the shield element 14 and into a portion of the multiple board array 20.

VI. Issues

The following issue is presented in this appeal, corresponding directly to the Examiner's final ground for rejection and the Final Office Action:

- a) Whether claims 18, 20, and 21 under 35 USC 102(b) are anticipated by Boyd. (US 3,562,058).

VII. Argument**The Rejection of Claims 18, 20 and 21 rejected under 35 USC 102(b)**

Claims 1 and 4 stand rejected under 35 USC 102(b) as being anticipated by Boyd. (US 3,562,058). The Boyd teaches an apparatus for the breaking up of a scribed wafer 6 by sealing it in a vacuum seal bag 3,4, placing it on a rubber surface 32 (see paragraph 3, lines 4-28), and roller a roller 10 over the top to break the wafer 6 along the scribes). This is a brute force methodology of separating sections and contains none of the novel limitations of the present application.

The Examiner argued

- 1) that Col 1, lines 28-38 lay the foundation for Boyd teaching a plurality of electrical components formed on the substrate
- 2) that Boyd teaches alignment of the pre-scored planes with a splitting element 32
- 3) that the vacuum seal bag 3,4 anticipates the claimed removable shield element to reduce board flex

The Applicant respectfully requests the Board overturn these arguments.

First, Col 1, lines 28-38 mention in passing that it is common for a number of components or circuits to be formed on semiconductor material. Boyd, while mentioning this in a background statement, does not go on in the specification to

address loading the semiconductor material without damage to these components. As a matter of fact, Boyds entire method of separation comprises pressing the entire assembly onto a rubber mat utilizing a gigantic roller. This in no way teaches the claimed limitations of the present invention wherein the electrical components shielded from direct force, where a splitting element is aligned with the pre-scored plane and not the entirety of the array, and where board flex is reduced by loading of the shield rather than the board. None of these claimed limitations or the cited advantages are taught or anticipated by Boyd.

Furthermore, the argument that Boyd teaches alignment of the pre-scored planes with a splitting element is flawed. There is no alignment at all and element 32 is not a splitting element at all but a large rubber semi-flexible platform. There is clearly no alignment necessary or required for such a crude rendition of breaking. This limitation is not taught nor anticipated by Boyd.

Finally, the argument that the vacuum seal bag 3,4 in Boyd is the equivalent of the claimed removable shield element is clearly in error. There is absolutely no reference within Boyd for support of the proposition that the vacuum bag acts to reduced board flex, acts to prevent board loading from damaging the electrical components, or acts to transfer torque to the board. The vacuum bag is taught to be a thin flexible film that does nothing more that retain the pieces once they have been broken apart by a large roller. They do not reduce board flex, they allow it, that is how the Boyd invention works. There is not teaching, and common sense dictates otherwise, that a flexible vacuum bag will somehow protect the electrical components by taking the loading. Rather the flexible bag will simply transfer the load from the oversized roller directly onto such components. Nothing in Boyd teaches otherwise. This limitation is clearly not taught by Boyd.

These limitations are not taught or anticipated by Boyd either alone or in combination. Boyd teaches the old method of crudely smashing apart a circuit

board array by pressing it into a flexible rubber surface. It teaches absolutely NO ability to reduce board flex, NO use of a shield element, and NO alignment of the pre-scored planes. The vacuum bag of Boyd cannot be found to be the equivalent of any of these limitations. It is a thin flexible film (column 2, line 28-38) that will transfer force from the roller 10 directly down into anything below it or between it. This fails to teach the claimed limitations of the present invention and therefore the rejections should be withdrawn.

In light of the arguments presented and the lack of proper teaching found in the cited reference, the Applicant respectfully seeks reconsideration from the Board and reversal of these rejections.

IX. Appendix

A copy of each of the claims involved in this appeal, namely claims 18,20 and 21 is attached hereto as Appendix A.

X. Conclusion

For the foregoing reasons, Applicant respectfully requests that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'T. Donohue', is written over a horizontal line.

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APPENDIX A

18. (Rejected) A method of separating individual circuit boards from a multiple board array with pre-scored planes comprising:

aligning one of the pre-scored planes with a splitting element,

affixing a removable shield element to an individual circuit board portion of the multiple board array;

loading the removable shield element to reduce board flex; and

inducing torque on the multiple board array such that the multiple board array is forced onto the splitting element and breaks along the pre-scored plane.

20. (Rejected) An apparatus for separating individual circuit board from a multiple board array with pre-scored planes and a plurality of electrical components comprising:

at least one splitting element positioned along one of the pre-scored planes; and

at least one torque inducing element using surface loading to mechanically force the multiple board array onto said at least one splitting element and thereby breaking the multiple board array along the pre-scored plane said at least one torque inducing element forcing the multiple board array without loading the plurality of electrical components, wherein said torque inducing element applies said surface loading to the multiple board array by way of a shield element attached to the individual circuit board such that the plurality of electrical components remain undamaged; and

a transport element for automatically aligning one of the pre-scored planes with said at least one splitting element.

21. (Rejected) A method of separating individual circuit boards from a multiple board array with pre-scored planes comprising:

aligning one of the pre-scored planes with a splitting element, and inducing torque on the multiple board array such that the multiple board array is forced onto the splitting element and breaks along the pre-scored plane, wherein said inducing torque on the multiple board array includes transferring load from a torque inducing element through a shield element into a portion of the multiple board array.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS

None.